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ABSTRACT

Four sequential Basic Skill Levels (levels N, O, P, and PA) of a self-paced, individualized mathematics program designed to improve the achievement of junior high school students are presented in this student workbook. Each level includes a pretest, five to nine lessons, quizzes (checkpoints) after each fourth or fifth lesson, a posttest, and a level review worksheet. Students must successfully complete the level they are on before proceeding to the next. The levels presented in this workbook are: (1) ratios; (2) proportions; (3) percents; and (4) working with percents. (DC)

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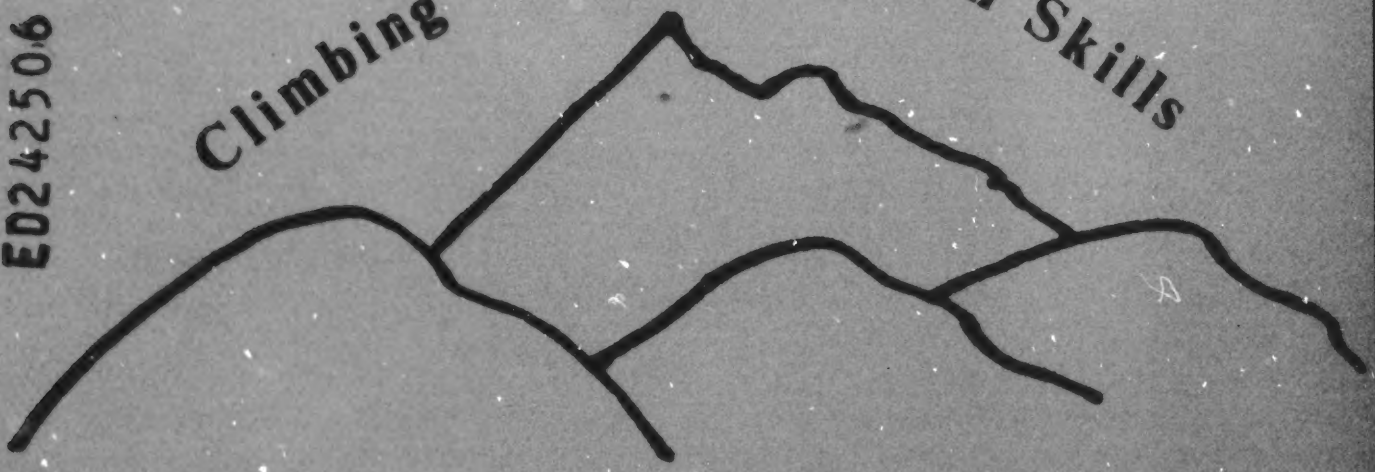
Climbing the Hills of Math Skills



CALIFORNIA

DEMONSTRATION

MATHEMATICS PROGRAM

Percents

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SE044 130

Hillview Junior High
Pittsburg Unified School District
Pittsburg, California

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HILLVIEW JR. HIGH SCHOOL
CALIFORNIA MATH DEMONSTRATION PROGRAM

PERCENTS

LEVEL N Ratios

LEVEL O Proportions

LEVEL P Percents

LEVEL PA Working with Percents

(Each Level consists of a Pretest, Lessons, Checkpoints, Posttest and Level Review)

PRETEST LEVEL N

Name_____

Period_____

Date_____

1. There are 7 girls and 6 boys in a class. What is the ratio of girls to boys?_____. What is the ratio of boys to the total class?_____.

2. Quantities compared by division are called_____. (N-1)

3. Write three ratios for the quantities given below.

3 cats, 4 dogs, and 8 mice

a._____ b._____ c._____ (N-2)

Simplify these ratios:

4. 4 to 6 _____

5. $3\frac{1}{2}$ to 7 _____

6. $1\frac{2}{3}$ to $4\frac{1}{4}$ _____ (N-3)

7. 8.8 to . 9 _____

8. .4 to .7 _____

9. 4.8 to 32 _____

10. $3\frac{1}{4}$ to 2.6 _____ (N-4)

Which is the higher ratio?

11. 45 to 40 or 50 to 46 _____

12. $3\frac{1}{2}$ to $4\frac{3}{4}$ or $2\frac{1}{2}$ to $3\frac{1}{4}$ _____

13. 16 to 21 or 18 to 24 _____ (N-5)

Simplify these ratios:

14. 8 inches to 2 feet = _____

15. 3 feet to 4 yeads = _____

16. 6 kilometers to 4 kilometers = _____ (N-6)

RATIO N-1

Name _____ Period _____ Date _____

Objective: You will be able to write a ratio comparing two quantities

There are two ways to compare quantities. One by subtraction and one by division. Comparing quantities by division is called ratio. (ray-sho).

Examples:	Won	Lost	Games Played
Raiders	10	5	15
49ers	8	8	16

Ratio of wins to losses could be written as

(wins ÷ losses) ($\frac{\text{wins}}{\text{losses}}$) or (wins to losses)

(1) Raiders: $\frac{\text{wins}}{\text{losses}} = \frac{10}{5}$ so the ratio of wins to losses is 10 to 5.

(2) 49ers: $\frac{\text{wins}}{\text{losses}} = \frac{8}{8}$ so the ratio of wins to losses is _____ to _____

(3) What is the ratio of wins to games played for

Raiders = _____ to 15.

49ers = _____ to _____.

There are 13 girls and 15 boys in a math class.

(4) The ratio of girls to boys is 13 to _____.

(5) The ratio of boys to girls is _____ to 13.

(6) The ratio of girls to the total class is _____ to 28 (13+15).

(7) The ratio of boys to the total class is _____ to _____.

There were 21 hits, 16 misses in a ball game.

(8) The ratio of hits to misses is 21 to _____.

(9) The ratio of misses to hits is 16 to _____.

(10) The ratio of hits to total times at bat is _____ to 37.

(11) The ratio of misses to total times at bat is 16 to _____.

(12) The ratio of total times at bat to hits is 37 to _____.

(13) The ratio of total time at bat to misses is _____ to _____.

Now lets show ratios in fraction form.

320 seventh graders, 310 eighth graders.

(14) The ratio of seventh graders to eighth graders is $\frac{320}{310}$

(15) The ratio of eighth graders to seventh graders is $\frac{\quad}{320}$

(16) The ratio of eighth graders to both grades is $\frac{\quad}{630}$

(17) The ratio of seventh graders to both grades is _____.

Coffee 3 parts, water 60 parts.

(18) The ratio (in fraction form) of coffee to water is $\frac{3}{60}$.

(19) The ratio (division) of water to coffee is _____.

(20) The ratio of coffee to total mixture is _____.

(21) The ratio of water to total mixture is _____.

From now on, lets show all ratios by <u>division</u> (fraction form).

21 dogs, 10 cats

(22) The ratio of dogs to cats is $\frac{\quad}{10}$

(23) The ratio of cats to dogs is _____.

(24) The ratio of cats to total animals is _____.

(25) The ratio of dogs to total animals is _____.

21 desks, 25 students (you may have to stand).

(26) The ratio of desk to students (fraction form) is _____.

(27) The ratio of students to desk is _____.

12 tables, 47 legs (one leg walked off).

(28) Ratio of legs to tables is _____(fraction form).

(29) Ratio of tables to legs is _____(fraction form)

(30) Comparing two quantities by division is called a _____.

RATIOS N-2

Name _____ Period _____ Date _____

Objective: You will be able to write ratios comparing three or more quantities.

1. Ratios are the comparison of quantities by division.

A cake mix calls for 3 eggs, 4 cups of flour, 1 cup of milk.

2. What is the ratio of eggs to flour? 3/4. (fraction)
3. What is the ratio of eggs to milk? _____.
4. What is the ratio of milk to flour? _____.
5. What is the ratio of flour to eggs? _____.
6. What is the ratio of flour to milk? _____.
7. What is the ratio of eggs to total mixture? 3/8.
8. What is the ratio of flour to total mixture? _____.
9. What is the ratio of milk to total mixture? _____.

21 cookies, 15 cokes, and 18 children

10. Ratio of cookies to cokes is _____.
11. Ratio of cookies to children is _____.
12. Ratio of children to cokes is _____.
13. Ratio of cokes to cookies is _____.
14. Ratio is the comparison of quantities by _____.
15. Write three ratios comparing things in your classroom.

example: $\frac{1 \text{ room}}{6 \text{ windows}}$

a. _____ b. _____ c. _____

(x x x x x x x) (o o o o)

16. What is the ratio of x's to circles? _____.
17. What is the ratio of circles to x's? _____.
18. What is the ratio of circles to the total figures? _____.
19. What is the ratio of x's to the total figures? _____.

(% % % % % % % % %) ($ $ $ $ $ $)

20. What is the ratio of percents to dollar signs? _____.
21. What is the ratio of dollar signs to percents? _____.
22. What is the ratio of total figures to dollar signs? _____.
23. What is the ratio of total figures to percents? _____.
24. What is the ratio of the letter "s" to total letters in Mississippi? _____.
25. What is the ratio of "m"'s to "p"'s in Mississippi? _____.

Write at least 5 ratios for each set of information given below.
Describe each ratio by words.

3 bags cement, 25 bags rock, 30 bags sand

26. A) $\frac{3 \text{ cement}}{25 \text{ rocks}}$ B) C)

D) E)

27. 10 boys, 15 girls, 5 teachers

A) $\frac{10 \text{ boys}}{15 \text{ girls}}$ B) C)

D) E)

28. 10 dogs, 15 cats, 20 mice

A) $\frac{10 \text{ dogs}}{15 \text{ cats}}$ B) C)

D) E)

29. Write the ratio of 11 trains to 4 trains using two different forms.

A)

B)

Write the following ratios in fractional form:

30. 5 peaches to 6 peaches _____.

31. 9 pencils to 5 pencils _____.

32. 7 mice to 2 snakes _____.

33. 2 cups of milk to 3 cups of water _____.

34. Write a ratio comparing the number of girls present in the room right now to the number of boys present._____.

35. Write a ratio comparing the number of periods you have before lunch to the number of periods you have after lunch. _____.

36. Write a ratio comparing the number of pencil sharpeners in the room to the number of students. _____.

RATIO N - 3

Name _____ Period _____ Date _____

Objective: You will be able to simplify ratio.

Simplifying ratios is similar to simplifying fractions.

Examples:

Ratio of 4 to 2 = $\frac{4}{2} = \frac{2}{1}$

Ratio of 6 to 2 = $\frac{6}{2} = \frac{3}{1}$

Simplify the following ratios.

(1) 8 to 4 = $\frac{8}{4} = \frac{2}{1}$

(2) 9 to 3 = ____ = ____

(3) 6 to 12 = ____ = ____

(4) 8 to 10 = ____ = ____

(5) 6 to 8 = ____ = ____

(6) 10 to 12 = ____ = ____

(7) 15 to 18 = ____ = ____

(8) 18 to 21 = ____ = ____

(9) 34 to 17 = ____ = ____

(10) 19 to 38 = ____ = ____

(11) 42 to 34 = ____ = ____

(12) 85 to 100 = ____ = ____

(13) 42 to 39 = ____ = ____

(14) 8 to 18 = ____ = ____

(15) 21 to 18 = ____ = ____

(16) 24 to 27 = ____ = ____

Some ratios are more difficult to simplify.

(17) $8\frac{1}{2}$ to $4\frac{2}{3} = \frac{8\frac{1}{2}}{4\frac{2}{3}} = \frac{\frac{17}{2}}{\frac{14}{3}} = \frac{17}{2} \div \frac{14}{3} = \frac{17}{2} \times \frac{3}{14} = \frac{51}{28}$

(18) $2\frac{1}{4}$ to $3\frac{1}{2} = \frac{2\frac{1}{4}}{3\frac{1}{2}} = \frac{\frac{9}{4}}{\frac{7}{2}} =$

(19) $3\frac{1}{4}$ to $2\frac{1}{2} = \frac{3\frac{1}{4}}{2\frac{1}{2}} =$

(20) $1\frac{1}{4}$ to $2\frac{1}{3}$ = _____ =

(21) $8\frac{1}{3}$ to 4 = $\frac{8\frac{1}{3}}{4}$ =

(22) 6 to $4\frac{1}{5}$ = _____ =

Name_____

(23) 7 to $8\frac{1}{3}$ = _____

(24) $1\frac{2}{3}$ to $4\frac{1}{4}$ = _____

Simplify these ratios.

(25) 54 correct out of 60. $\frac{54}{60} = \frac{9}{10}$

(26) 35 gallons of water to $3\frac{1}{2}$ bags of cement. _____

(27) 4 oranges to 8 bananas. _____

(28) 85 hits to 190 times at bat. _____

(29) $4\frac{1}{4}$ inches for each 3 inches. _____

(30) 350 meters to 7 hours travel. _____

(31) $6\frac{1}{2}$ oranges to $2\frac{1}{4}$ lemons. _____

(32) 8 boys to 312 girls. _____

(33) $15 for 250 grams. _____

(34) 8 apples for $2\frac{1}{4}$ pies. _____

(35) $18\frac{1}{2}$ lbs. candy for 6 people. _____

(36) A jet travels 650 mph and a prop plane travels 350 mph. What is the ratio of their speeds? _____

(37) A cadillac cost $6500 and a Honda cost $350. What is the ratio of their cost? _____

(38) Coffee cost 79¢ per pound. Chocolate cost 68¢ per pound. What is the ratio of their cost? _____

(39) 10 liters of flour makes 144 cookies. What is the ratio of cookies to flour? _____

(40) 40 strawberries make 4 shortcakes. What is the ratio of strawberries to shortcakes? _____

RATIO N - 4

Name _____ Period _____ Date _____

Objective: You will be able to simplify ratios involving decimals.

A ratio involving decimals can be simplified by multiplying each term by a power of ten.

(1) 4.5 to 6.5 = $\frac{4.5}{6.5} = \frac{4.5 \times 10}{6.5 \times 10} = \frac{45}{65} = \frac{9}{13}$

(2) 3.2 to 4.8 = $\frac{3.2}{4.8} = \frac{3.2 \times}{4.8 \times} = \frac{32}{48} = \frac{2}{3}$

(3) 1.2 to 2.4 = ____ = ____ = ____ = ____

(4) 3.5 to 7 = $\frac{3.5}{7} = \frac{3.5 \times 10}{7 \times 10} = \frac{35}{70} = \frac{1}{2}$

(5) 7 to 3.5 = ____ = ____ = ____ = ____

(6) 8.1 to .9 = ____ = ____ = ____ = ____

(7) .3 to .4 = _____

(8) 1.2 to 24 = _____

(9) .4 to .7 = _____

(10) 3.8 to 2.4 = _____

(11) 2.4 to .3 = _____

(12) .4 to 2.8 = _____

(13) 4.8 to 32 = _____

(14) 42 to .7 = _____

When fractions and decimals are both involved, they should be changed to either both fractions or both decimals.

(15) $3\frac{1}{2}$ to 2.7

(Fraction) $3\frac{1}{2}$ to $2\frac{7}{10} = \frac{\frac{7}{2}}{\frac{27}{10}} = \frac{7}{2} \times \frac{10}{27} = \frac{35}{27}$

Name _____

(16) $3\frac{1}{2}$ to 2.7

(Decimal) 3.5 to 2.7 = $\frac{3.5}{2.7} = \frac{3.5 \times 10}{2.7 \times 10} = \frac{35}{27}$

(17) Are the answers to 15 and 16 the same? _____

Simplify these both ways.

(18) $2\frac{1}{4}$ to 2.5

(a) (Fraction) $2\frac{1}{4}$ to $2\frac{5}{10}$ = _____.

(b) (Decimal) 2.25 to 2.5 = _____.

(19) 3.4 to $8\frac{2}{5}$

(a) (Fraction) _____.

(b) (Decimal)

(20) $4\frac{1}{5}$ to 3.4

(a) (Fraction)

(b) (Decimal)

(21) $2\frac{1}{2}$ to 7.9

(a) (Fraction)

(b) Decimal)

(22) $17\frac{4}{5}$ to 6.9

(a) (Fraction)

(b) (Decimal)

(23) $1\frac{4}{5}$ to 13.4

(a) (Fraction)

(b) (Decimal)

LEVEL N CHECKPOINT 1-4

Name _____

Period _____

Date _____

Ratios

7 dogs 3 cats

1) ratio of dogs to cats _____ to _____

2) ratio of cats to dogs _____ to _____

13 pencils, 10 erasers: put in fraction form

3) ratio of erasers to pencils _____

(N-1)

20 kids, 17 balloons 9 skateboards: put in fraction form

4) ratio of kids to skateboards _____

5) $\frac{17}{20}$ is the ratio of _____ to _____.

(N-2)

Simplify the following ratios:

6) 21 to 18 _____ to _____

fraction form

7) $3\frac{1}{4}$ to $2\frac{1}{2}$ _____

8) 8 boys to 30 girls _____

(N-3)

Simplify: Use fraction form

9) 1.2 to .24 _____

10) $2\frac{1}{2}$ to 3.6 _____

(N-4)

Name _____

LEVEL N A-CHECKPOINT 1-4

Period _____

Ratios

Date _____

3 cokes 5 kids

1) ratio of cokes to kids _____ to _____

2) ratio of kids to cokes _____ to _____

3) Comparing two quantities by division is called a _____.

(N-1)

31 rulers, 16 protractors, 13 compasses

(put in fraction form)

4) ratio of protractors to rulers _____

5) $\frac{13}{16}$ is the ratio of _____ to _____.

(N-2)

Simplify the following ratios

6) 10 to 12 _____ to _____

fraction form

7) 6 to $4\frac{1}{5}$ _____

8) 8 apples for $2\frac{1}{4}$ pies _____

(N-3)

Simplify: use fraction form

9) 3.8 to .3 _____

10) 3.4 to $2\frac{2}{5}$ _____

(N-4)

RATIOS N - 15

Name _____ Period _____ Date _____

Objective: You will be able to compare two ratios and tell which ratio is larger.

In the previous lesson you were shown a way to compare two ratios.

Here is a short cut method to use when comparing two ratios.

SHORT CUT METHOD

a) Write ratios as fractions
b) Take cross products (denominator of one fraction times numerator of the other fraction). Write the product beside the numerator used.
c) The fraction beside the larger product is the higher ratio.

Which is the high ratio?

EX) 3 to 8 or 2 to 5

a) $\frac{3}{8}$ $\frac{2}{5}$

b) $\frac{15}{\frac{3}{8}}$ $\frac{16}{\frac{2}{5}}$

c) $\frac{15}{\frac{3}{8}}$ $\frac{16}{\frac{2}{5}}$ So: 2 to 5 is the higher ratio

EX) $3\frac{1}{2}$ to $4\frac{1}{4}$ or $3\frac{1}{4}$ to $4\frac{1}{5}$

a) $\frac{3\frac{1}{2}}{4\frac{1}{4}}$ $\frac{3\frac{1}{4}}{4\frac{1}{5}}$

b) $\frac{14\frac{7}{10}}{3\frac{1}{2}}$ $\frac{13\frac{3}{16}}{3\frac{1}{4}}$ $\frac{}{4\frac{1}{4}}$ $\frac{}{4\frac{1}{5}}$

c) $\frac{14\frac{7}{10}}{3\frac{1}{2}}$ $\frac{13\frac{13}{16}}{3\frac{1}{4}}$ $\frac{}{4\frac{1}{4}}$ $\frac{}{4\frac{1}{5}}$

So: $3\frac{1}{2}$ to $4\frac{1}{4}$ is the higher ratio

Name _____ _____ Period _____ Date _____

Objective: You will be able to simplify a ratio.

1. In a previous lesson we simplified ratios the same way we reduced fractions. So $\frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$

Simplify these ratios:

a. $\frac{20}{25}$ = b. $\frac{8}{12}$ = c. 5 to 15 =

d. 9 to 6 = e. $\frac{6}{16}$ = f. $\frac{15}{12}$ =

2. Did you find that $\frac{20}{25} = \frac{4}{5}$? _____.

$\frac{20}{25} = \frac{4}{5}$ are equivalent ratios. $\frac{4}{6}$ and $\frac{2}{3}$ are _____ ratios.

3. Write a ratio which is equivalent to each of these:

a. $\frac{5}{15}$ = b. $\frac{6}{2}$ = c. $\frac{14}{10}$ = d. 4 to 3 =

4. Is the ratio of 6 inches to 1 foot the same as 6 to 1? _____.
No, because the ratio 6 to 1 means that the first is 6 times greater than the second. So to simplify 6inches to 1 foot, we have to write it like this/

$$\frac{6 \text{inches}}{1 \text{ foot}} = \frac{6 \text{ inches}}{12 \text{ inches}} \left(1 \text{ foot} = 12 \text{ inches}\right) = \frac{6}{12} = \text{_____}$$

5. In problem #4, we changed 1 foot to 12 inches so that we could compare inches with inches. Find the ratio of 2 yards to 2 feet.

$$\frac{2 \text{ yards}}{2 \text{ feet}} = \frac{6 \text{ feet}}{2 \text{ feet}} = \text{_____}$$

Find the following ratios and simplify them if possible. Remember to change the parts to like units so you can compare inches to inches, cents to cents, grams to grams, etc.

6. 1 dime to 1 dollar = _____
7. 2 feet to 22 inches = _____
8. 1 yard to 20 inches = _____
9. 1 quarter to 2 dollars = _____
10. 3 quarts to 1 pint = _____
11. 40 inches to 4 feet = _____
12. 5 meters to 20 meters = _____
13. 9 milliliters to 6 milliliters = _____

Name _____

Find the following ratios and simplify them if possible.

14. 5 kilometers to 3 kilometers = _____.
15. 16 inches to 1 foot 1 inch = _____.
16. 20 cents to 1 quarter = _____.
17. 45 to 30 = _____.
18. 22 to 11 = _____.
19. 9 to 17 = _____.
20. 5 grams to 3 grams = _____.
21. 3 dollars to 50 cents = _____.
22. 1 liter to 18 liters = _____.

23. Which is a better buy, 3 pounds 4 ozs. of tea at $1.09 or 46 ozs. at $1.02 ? _____ (Remember to compare like units There are 16 ozs in a pound.)

24. Bill worked 2 hours and 20 minutes for $3.05. Sam worked 2 hours and 40 minutes for $3.25. Which is paid at the higher hourly salary? _____

25. Rex worked for 6 hrs and earned $46.00. Jerry worked for 4 hrs and earned $28.00. Which was paid the higher hourly rate?

_____

26. A swimming pool is 24 feet by 6 yards. What is the ratio of the length to the width?

_____

27. A car travels 240 kilometers in 6 hours. Another car travels 287 kilometers in 420 minutes. Which car traveled at the higher rate of speed?

_____

28. A football field measures 120 yards by 150 feet. What is the ratio of the length to the width?

_____

29. A punch recipe calls for 8 quarts of water for 2 pints of juice. What is the ratio of water to juice?

_____

30. Lola can type 60 words per minute. Judy can type 3,600 words per hour. Which lady is the faster typer?

_____

CIRCLE THE HIGHER RATIO

1) 1 to 3 or 3 to 8

$1 \times 8 = 3$ $3 \times 3 = 9$

$\frac{1}{3} \nearrow \frac{3}{8}$

2) 2 to 5 or 3 to 7

$\frac{2}{5} \nearrow \frac{3}{7}$

3) 4 to 6 or 5 to 8

4) 4 to 22 or 5 to 24

5) 7 to 12 or 15 to 28

6) 21 to 33 or 37 to 50

7) 22 to 13 or 21 to 14

8) 15 to 21 or 18 to 23

9) 1 to 8 or 2 to 15

10) 121 to 150 or 71 to 90

11) $2\frac{1}{2}$ to 3 or 4 to 5

12) $3\frac{1}{3}$ to $3\frac{1}{2}$ or $4\frac{1}{4}$ to $4\frac{1}{2}$

13) $1\frac{4}{5}$ to 2 or $2\frac{1}{2}$ to $2\frac{3}{5}$

14) 4 to 7 or $4\frac{1}{2}$ to $7\frac{1}{2}$

15) $1\frac{1}{3}$ to $5\frac{1}{2}$ or $2\frac{1}{3}$ to $7\frac{1}{2}$

LEVEL N CHECKPOINT 5-6

Ratios

Name_____

Period_____

Date_____

Which is the higher ratios?

1) 14 to 23 or 15 to 24

2) 7 to 12 or 15 to 28

3) $3\frac{1}{2}$ to $4\frac{1}{4}$ or $4\frac{1}{2}$ to 5

4) 21 to 32 or 24 to 36

(N-5)

Simplify these ratios

5) 3 nickels to a quarter _____

6) 8 inches to 3 feet _____

7) 60 Km to 100 Km _____

8) 4 quarters to 5 dollars _____

(N-6)

LEVEL N A-CHECKPOINT 5-6

RATIOS

Name_____

Period_____

Date_____

Which is the higher ratio:

1) 22 to 14 or 21 to 15 _____

2) 16 to 20 or 15 to 19 _____

3) $2\frac{1}{2}$ to $3\frac{1}{2}$ or $2\frac{1}{4}$ to $3\frac{1}{4}$ _____

4) 18 to 24 or 16 to 21 _____

(N-5)

Simplify these ratios:

5) 20 cents to a quarter _____

6) 2 feet to 3 yards _____

7) 5 grams to 15 grams _____

8) 3 dimes to 2 dollars _____

(N-6)

POSTTEST LEVEL N

RATIOS

Name _____

Period _____

Date _____

1. 13 games won, 21 games lost. What is the ratio of games won to games lost ? _____

2. 15 dogs, 13 cats. What is the ratio of cats to dogs? _____

3. Quantities compared by _____ are called ratios. (N-1)

Write three ratios for the quantities given below.
9 boys, 11 girls, and 2 teachers.

4. _____ 5. _____ 6. _____

(N-2)

Simplify these ratios:

7. 6 to 8 = _____ 8. 4 to $9\frac{1}{2}$ = _____

9. $2\frac{1}{2}$ to $6\frac{1}{4}$ = _____

(N-3)

Simplify these ratios:

10. 6.5 to 4.2 = _____ 11. 7 to 2.4 = _____

12. 2.6 to $3\frac{1}{4}$ = _____ 13. $3\frac{1}{5}$ to 2.7 = _____

(N-4)

Which is the higher ratio:

14. 46 to 22 or 50 to 26 _____

15. $2\frac{1}{2}$ to $3\frac{1}{2}$ or $3\frac{1}{2}$ to $4\frac{3}{4}$ _____

16. 16 to 21 or 18 to 24 _____

(N-5)

Simplify these ratios:

17. 8 inches to 2 feet _____ 18. 3 feet to 4 yards _____

19. 6 pints to 4 quarts _____

(N-6)

Name _____

Period _____

Date _____

PRETEST

Level 0 Proportions

Write three equivalent ratios for the following set

XXXXXXXXXXXX 0000

1) _____ (0-1) 2) _____ 3) _____

(4) $\frac{4}{6} = \frac{1}{2}$ (True - False) (0-2)

(5) $\frac{2}{3} = \frac{4}{6}$ (True - False) (0-2)

(6) $\frac{4}{5} = \frac{8}{10}$ (True - False) (0-2)

(7) $\frac{2}{3} = \frac{N}{9}$, N = _____ (0-3)

(8) $\frac{5}{7} = \frac{15}{N}$, N = _____ (0-3)

(9) $\frac{N}{25} = \frac{4}{1}$, N = _____ (0-3)

(10) Records at 3 for 96¢, how much will 5 cost? _____ (0-4) (0-5)

(11) 54 miles on 3 gallons, how many miles on 7 gallons? _____ (0-4) (0-5)

(12) 12 for 66 cents, 16 for _____ cents. (0-4) (0-5)

PROPORTION 0 - 1

Name _____ Period ____ Date _____

Objectives: You will be able to use a ratio to divide objects into groups, and write equivalent ratios.

Materials: Box of 27 cubes.

You worked several packets in which you studied ratio. Remember, a ratio is a way of matching sets of objects. Write a ratio for the following sets:

(1) O O O O O O — O's to X's = $\frac{6}{3}$
X X X

(2) X X X — X's to O's = _____
O O O O O O — O's to X's = _____

(3) X X X X X X — Y's to X's = _____
Y Y

(4) Z Z Z — Z's to W's = _____
W W W W — W's to Z's = _____

Get a box of cubes from your teacher. Put 18 cubes on your desk.

(5) Separate the blocks into two groups so the ratio of the number of blocks in the two groups is 1 to 2.
How many in each group? _____ and _____

(6) Use a ratio of 2 to 4, how many in each group? _____ and _____

(7) Use a ratio of 3 to 6, how many in each group? _____ and _____

(8) Does the ratio $\frac{1}{2} = \frac{2}{4}$ _____? Does the ratio $\frac{2}{4} = \frac{3}{6}$ _____?

Place 27 cubes in front of you. Pretend they are dollars. If these dollars are to be divided between you and another person, how many dollars would you get using the following ratios?
(Always compare yourself to the other person.)

(9) Use the ratio $\frac{1}{2}$ you would get _____ dollars.
The other person would get _____ dollars.

(10) Using a $\frac{3}{6}$ ratio you would get _____ dollars.
The other person would get _____ dollars.

Name _____

Place 24 cubes in front of you. Pretend they are dollars, to be divided between you and Archie.

You
Archie

(11) Using the ratio of $\frac{1}{2}$ you would get _____ dollars.

(12) Using the ratio of $\frac{2}{4}$ you would get _____ dollars.

(13) Which ratio $\frac{1}{2}$ or $\frac{2}{4}$ gave you the most money? _____

(14) Does this mean that $\frac{1}{2}$ and $\frac{2}{4}$ are equal ratios? _____

(15) When grouping by equal ratios will the results always be the same ? _____

(16) Use 24 cubes again - consider them as dollars. Would you rather have them divided in a ratio of 1 to 2 or 4 to 8?

_____

(17) Write 1 to 2 as a ratio in fraction form. _____

(18) Write 4 to 8 as a ratio in fraction form. _____

(19) Which ratio $\frac{1}{2}$ or $\frac{4}{8}$ gave you the most money? _____

(20) Does this mean $\frac{1}{2} = \frac{4}{8}$? _____

(21) Using the same 24 cubes what other ratio can you use so that you will get eight dollars and Archie will get 16? _____

Put the cubes away.

Here are three equal ratios. $\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$

(22) In dividing 18 dollars Sharon to Merlin, will Sharon receive more dollars using the $\frac{1}{2}$ ratio, the $\frac{2}{4}$ ratio or the $\frac{3}{6}$ ratio?

_____

(23) How many will Sharon get using the $\frac{1}{2}$ ratio? _____

(24) How many will Sharon get using the $\frac{2}{4}$ ratio? _____

(25) How many will Sharon get using the $\frac{3}{6}$ ratio? _____

(26) Circle the ratios which will compare a's to b's in this picture.

a a a a a a a a a a a a	b b b b

$\frac{12}{4}$ $\frac{6}{4}$ $\frac{3}{2}$ $\frac{8}{1}$ $\frac{5}{2}$ $\frac{6}{2}$

WHAT IS A PROPORTION? O - 2

Name _____ Period _____ Date _____

Objective: You will be able to set up a proportion.

(1) Write a ratio equal to $\frac{1}{2}$. Put your answer in the box below.

$\frac{1}{2} = \frac{2}{\quad}$

The sentence in the box says that $\frac{1}{2}$ = _____. This sentence is called a proportion (pronounced: pro-por-shun) because the first ratio equals the second ratio.

(2) A math sentence called a proportion says that two _____ are equal.

Write a ratio equal to the following ratios.

(3) $\frac{1}{3}$ = _____ (4) $\frac{1}{4}$ = _____

(5) $\frac{2}{3}$ = _____ (6) $\frac{1}{5}$ = _____

Circle the mathematical sentences below which are proportions.

(7) $\frac{2}{3} = \frac{4}{6}$ (8) $\frac{1}{2} = \frac{2}{1}$ (9) $\frac{3}{4} = \frac{6}{12}$

(10) $\frac{5}{4} = \frac{7}{6}$ (11) $\frac{3}{4} = \frac{6}{8}$ (12) $\frac{5}{8} = \frac{10}{16}$

(13) $\frac{4}{6} = \frac{8}{12}$ (14) $\frac{10}{2} = \frac{5}{1}$ (15) $\frac{2}{10} = \frac{1}{5}$

(16) $\frac{11}{12} = \frac{12}{11}$

(17) Fill in the ratios and write a proportion.

Player	Number of hits	Times at bat	Ratio of hits to times at bat	Proportion for 3 times as many hits
Jack	4	10	$\frac{4}{10}$	$\frac{4}{10} \times \frac{3}{3} = \frac{12}{30}$
Mr. Green	5	15		
Alvin	1	9		
Joe	6	7		
Mike	10	10		
Mr. Jaso	0	8		

Name _____

(18) An easy way to check a sentence to see if it <u>is</u> a proportion is by comparing cross products.

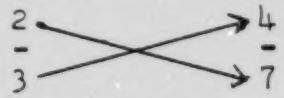
Is $\frac{2}{3} = \frac{4}{6}$ a proportion? _____

$2 \times 6 = 3 \times 4$

$12 = 12$

Since the cross products are equal, it is a proportion.

(19) Is $\frac{2}{3} = \frac{4}{7}$ a proportion? _____



$2 \times 7 = 3 \times 4$

$14 = 12$

Since the cross products are not equal, it is not a _____.

Work each problem <u>exactly</u> as the example. Check "yes" if they are are proportions; check "no" if they are not proportions.

<u>Example</u>: $\frac{2}{5} \rightarrow \frac{4}{10}$ $2 \times 10 = 5 \times 4$, $20 = 20$ Yes X / No ____

(20) $\frac{1}{2} = \frac{3}{6}$ $1 \times 6 = __ \times __$, $__ = __$. Yes ____ / No ____

(21) $\frac{3}{4} = \frac{9}{12}$ $__ \times __ = 4 \times 9$, $__ = __$ Yes ____ / No ____

(22) $\frac{1}{8} = \frac{2}{16}$ Yes ____ / No ____

(23) $\frac{9}{10} = \frac{18}{20}$ Yes ____ / No ____

(24) $\frac{15}{10} = \frac{2}{3}$ Yes ____ / No ____

(25) $\frac{11}{12} = \frac{22}{10}$ Yes ____ / No ____

SOLVING PROPORTIONS 0 - 3

Name _____ Period _____ Date _____

Objective:	You will be able to solve proportions by using the cross product method.

Sometimes, one of the numbers in a proportion is missing. It can be found by using the cross-product method.

Work <u>each</u> problem as the example is worked.

Example: $\frac{2}{3} \rightarrow \frac{n}{15}$

$3 \times n = 15 \times 2$

$3 \times n = 30$

$n = 10$

<u>Check</u>: $\frac{10}{15} = \frac{5 \times 2}{5 \times 3} = \frac{2}{3}$

So, $\frac{10}{15} = \frac{2}{3}$

(1) $\frac{5}{6} = \frac{n}{36}$

$6 \times n = 5 \times 36$

$6 \times n = 180$

$n =$ _____

<u>Check</u>: $\frac{30}{36} = \frac{6 \times 5}{6 \times 6} = \frac{5}{6}$

(2) $\frac{5}{6} = \frac{15}{n}$

$5 \times n = 6 \times 15$

$5 \times n = 90$

$n =$ _____

<u>Check</u>:

(3) $\frac{2}{5} = \frac{n}{10}$

<u>Check</u>:

(4) $\frac{n}{35} = \frac{3}{7}$

<u>Check</u>:

(5) $\frac{2}{16} = \frac{5}{n}$

<u>Check</u>:

(6) $\frac{21}{n} = \frac{7}{10}$

<u>Check</u>:

(7) $\frac{21}{28} = \frac{6}{n}$

<u>Check</u>:

Name _____

(8) $\frac{15}{20} = \frac{18}{n}$ Check:

(9) $\frac{20}{8} = \frac{n}{6}$ Check:

(10) $\frac{n}{4} = \frac{19}{38}$ Check:

(11) $\frac{16}{n} = \frac{48}{9}$ Check:

(12) $\frac{21}{45} = \frac{7}{n}$ Check:

(13) $\frac{N}{21} = \frac{12}{84}$ Check:

(14) $\frac{34}{17} = \frac{N}{1}$ Check:

(15) $\frac{N}{25} = \frac{4}{1}$ Check:

(16) $\frac{21}{N} = \frac{105}{15}$ Check:

PROPORTION (VARIABLES, PROBLEMS) 0 - 4

Name _____ Period ____ Date _____

Objectives: You will be able to write a proportion including a variable, and solve simple problems by proportions.

To set up a proportion, you must compare each ratio in the same order.

(1) 2 candy bars cost 12¢, 8 candy bars cost 48¢. Suppose you decide to write a ratio comparing $\frac{\text{bars}}{\text{cost}}$.

$$\frac{\text{bars } 2}{\text{cost } 12} = \frac{\text{bars } 8}{\text{cost } 48}$$

Check the proportion: $\frac{2}{12} = \frac{8}{48}$

$2 \times ___ = 8 \times ___$

$___ = ___$

(2) If you do not compare ratios in exactly the same way, look what happens. (Use problem 1's figures)

$$\frac{\text{bars } 2}{\text{cost } 12} = \frac{\text{cost } 48}{\text{bars } 8}$$

$2 \times ___ = 48 \times ___$

$___ = ___$

Now is it a proportion? _____

How is a proportion written if part of one ratio is not given?

(1) In a class, the ratio of boys to girls is 5 to 6. If there are 15 boys, how many girls are there? _____

$$\frac{\text{boys } 5}{\text{girls } 6} = \frac{\text{boys } 15}{\text{girls } ?} \qquad \frac{5}{6} = \frac{15}{n}$$

$5 \times n = 6 \times 15$

$5n =$ _____

$n =$ 90 5

$n =$ _____

Proportion is $\frac{5}{6} = \frac{15}{?}$

(2) Mr. Green walks 3 blocks in 9 minutes. How many blocks will he walk in 36 minutes? _____

$$\frac{\text{blocks } 3}{\text{minutes } 9} = \frac{\text{blocks } ?}{\text{minutes } ?} \qquad 9 \times n = ___ \times ___$$

$9n =$ _____

$n =$ _____

(3) A boy crawls 20 meters in 9 minutes. How long will it take him to crawl 45 meters? _____

_____ = _____

$___ \times ___ = ___ \times ___$

_____ = _____

29 = _____

Name _____

Solve these problems:

(4) Ratio of girls to boys is $\frac{3}{4}$. There are 18 girls. How many boys are there. _____

(5) Apples are 12 for 66¢. How much money would 4 apples cost? _____

(6) Records are 4 for $3.00. How much money would 18 records cost? _____

(7) Gary saved 55 pennies in 70 days. How many days would it take to save 165 pennies? _____

(8) A "VW" goes 54 miles on 3 gallons of gas. How far would it go on 9 gallons? _____

(9) A "VW" goes 54 miles on 2 gallons of gas. How many gallons are needed to go 378 miles? _____

Name _____ Period ____ Date _____

Objective: You will be able to use proportions in solving problems.

When a proportion is written, it is important that the ratios be written in the same order.

Study this problem.

Example: Bill is paid $5 for every 4 baskets of apples he picks. What will he be paid for 20 baskets? _____

(1) Comparing dollars to baskets in each ratio:

$$\frac{\$5.00}{4 \text{ baskets}} = \frac{\$N}{20 \text{ baskets}}$$

$$5 \times 20 = 4 \times n$$
$$100 = 4 \times n$$
$$n = ____$$

Another example: If 12 ounces of candy costs 80¢, how much candy can you buy for $2?

(2) Comparing ounces to cents in each ratio.

$$\frac{12}{80} = \frac{n}{200}$$

$$12 \times 200 = 80 \times n$$
$$2400 = 80 \times n$$
$$n = ____$$

Set up a proportion for each of the following problems and find the solutions.

(3) A girl making punch finds that she needs 2 cups of sugar for each 3 lemons used. How many lemons for 12 cups of sugar?

_____

(4) Jim and Bill pick oranges for a farmer. They find that for every 5 boxes Jim picks, Bill will pick 7 boxes. If Jim picks 20 boxes a day, how many will Bill pick? _____

(5) Jerry earns $9 for each 2 hours he works. How much will Jerry earn for working 24 hours? _____

Look at the page of newspaper ads on the next sheet and solve these problems. Write the proportion first, then solve the problem.

(6) How much will 9 dish cloths cost? _____

Name _____

(7) How much will 5 lbs. of coffee cost at the 3 lb. price?
_____

At the 2 lb. price? _____

At the 1 lb. price? _____

Which is the best buy? _____

(8) How much will 8 lbs. of apples cost? _____

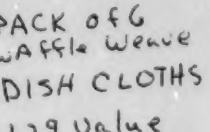
(9) How much will 5 toothbrushes cost? _____

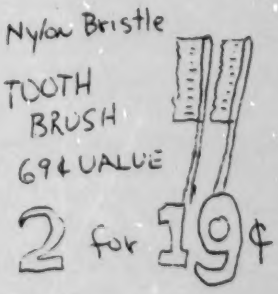
(10) On a map $\frac{1}{2}$ of an inch represents 20 miles. If the distance between two cities is 7 inches on the map, what is the actual distance between the cities? _____
(Set up the proportion and show the work.)

(11) If your father drives 200 miles in 4 hours, how far will he drive at the same rate in 7 hours? _____
Work here.

(12) Baxter sold 6 boxes of candy in 2 hours. If he continues to sell at the same rate, how many boxes will he sell in 8 hours? _____

(13) If my car uses 18 gallons of gasoline to go 300 miles, how many gallons will be required to go 700 miles?
_____





LEVEL 0 CHECKPOINT 1-5

Name _____

Period _____

Date _____

Proportions

Write equivalent ratios for the following set

XXXX 000000

1) _____ 2) _____

(0-1)

3) A math sentence called a proportion says that two _____ are equal.

Are the following sentences proportions? Yes or No

a) $\frac{1}{3} = \frac{3}{9}$ _____ b) $\frac{4}{5} = \frac{7}{8}$ _____

(0-2)

Solve these proportions

5) a. $\frac{5}{6} = \frac{n}{36}$ n = _____ b. $\frac{n}{35} = \frac{3}{7}$ n = _____

6) a. $\frac{34}{17} = \frac{n}{1}$ n = _____ b. $\frac{25}{n} = \frac{1}{4}$ n = _____

(0-3)

7) The ratio of girls to boys is $\frac{3}{5}$. If there are 20 boys, how many girls are there? _____

8) Records are 3 for $11.00. How much would 7 records cost? Round off to the nearest cent. _____

(0-4)

9) Joe earns $15 for each 2 hours works. How much will he earn for working 9 hours? _____

10) If my car uses 12 gallons of gas to go 220 miles on the freeway, how far can my car go on 7 gallons? _____

(0-5)

LEVEL 0 A-CHECKPOINT 1-5

Name _____

Period _____

Date _____

Proportions

Write equivalent ratios for the following set

XXXXXXXXXX 000000

1) _____ 2) _____

(0-1)

3) A math sentence called a _____ means that two ratios are equal.

4) Are the following sentences proportions. Yes or No

a. $\frac{8}{9} = \frac{16}{17}$ _____ b. $\frac{2}{3} = \frac{6}{9}$ _____

(0-2)

Solve these proportions:

5) a. $\frac{4}{7} = \frac{8}{n}$ n = _____ b. $\frac{n}{4} = \frac{16}{20}$ n = _____

6) a. $\frac{3}{5} = \frac{n}{30}$ n = _____ b. $\frac{11}{n} = \frac{132}{24}$ n = _____

(0-3)

7) The ratio of girls to boys is 3 to 5. If there are 12 girls, how many boys are there? _____

8) 8 track stereo tapes are 3 for $12.75 at Pete's Tape Shop. How much would it cost to buy 2 tapes? _____

(0-4)

9) Christina earns $10 for 3 hours of work. How much does she earn in 7 hours? (round off to the nearest cent) _____

10) A jet plane travels at 500 mph. How far does it travel in 15 minutes? (Hint: 15 minutes equals $\frac{1}{4}$ of an hour)

_____

(0-5)

Name _____

Period _____

Date _____

POST TEST

Level 0 Proportions

Write three equivalent ratios for the following set

XXXXXX 000000000000000000

1) _____ 2) _____ 3) _____
(0-1)

(4) $\frac{2}{3} = \frac{4}{6}$ (True - False) (0-2)

(5) $\frac{5}{8} = \frac{4}{6}$ (True - False) (0-2)

(6) $\frac{3}{5} = \frac{6}{10}$ (True - False) (0-2)

(7) $\frac{2}{5} = \frac{N}{40}$ N = _____ (0-3)

(8) $\frac{6}{7} = \frac{18}{N}$ N = _____ (0-3)

(9) $\frac{N}{15} = \frac{3}{5}$ N = _____ (0-3)

(10) Records at 4 for 96¢, how much will 7 cost? _____ (0-4) (0-5)

(11) 28 miles on 2 gallons, how many miles on 7 gallons? _____ (0-4) (0-5)

(12) 14 for 68¢, 19 for _____ cents. (0-4) (0-5)

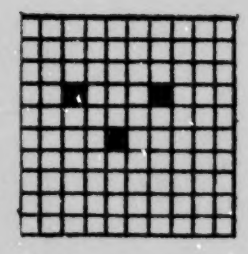
Name_____

Period_____ Date_____

1

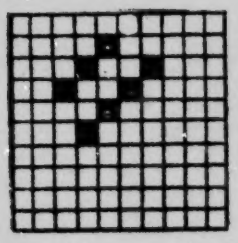
PERCENT
Introduction

PERCENTS COMPARE NUMBERS TO 100.



3 out of 100 are shaded.

RATIO	PERCENT (per 100)
$\frac{3}{100}$	= 3% = 3 percent

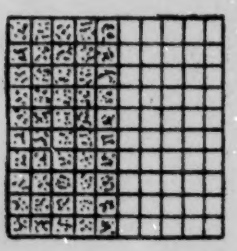


A. ___ out of ___ are shaded.

B. RATIO PERCENT

$\frac{\square}{\square} = \square\,\%$

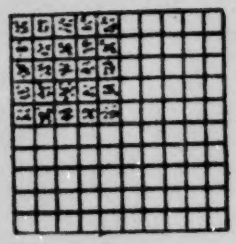
2.



A. ___ out of ___ are shaded.

B. RATIO PERCENT

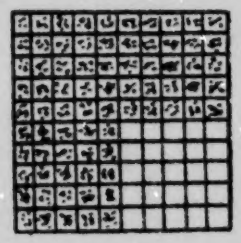
$\frac{\square}{\square} = \square\,\%$



A. ___ out of ___ are shaded.

B. RATIO PERCENT

4.

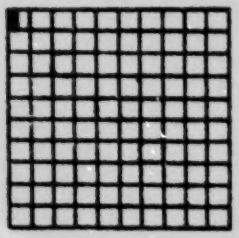


A. ___ out of ___ are shaded.

B. RATIO PERCENT

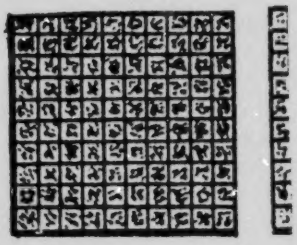
SOMETIMES PERCENTS ARE

LESS THAN 1



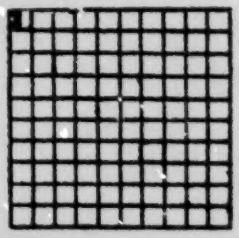
RATIO: $\frac{\frac{1}{2} \text{ square}}{100 \text{ squares}}$ = PERCENT (per 100): $\frac{1}{2}\%$

MORE THAN 100



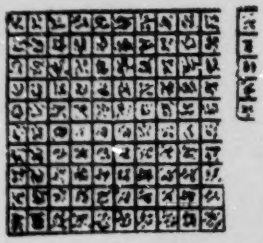
RATIO: $\frac{110 \text{ squares}}{100 \text{ squares}}$ = PERCENT (per 100): 110%

5.



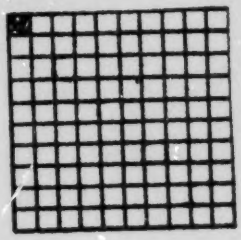
RATIO PERCENT

6.



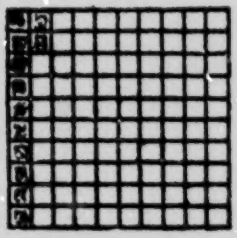
RATIO PERCENT

7.



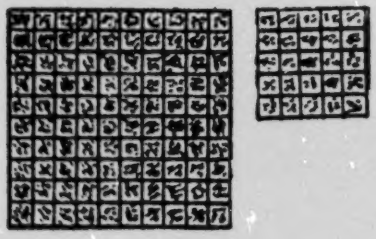
RATIO PERCENT

8.



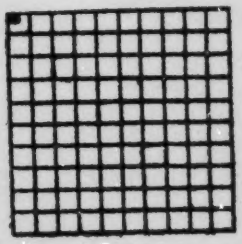
RATIO PERCENT

9.

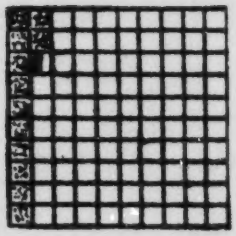


RATIO PERCENT

10.

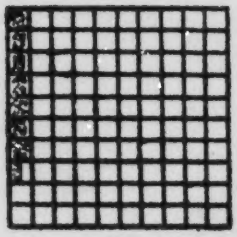


RATIO PERCENT

11. 

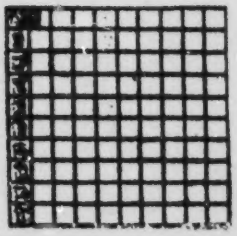
RATIO PERCENT

$\frac{12\frac{1}{2}}{100}$ =

12. 

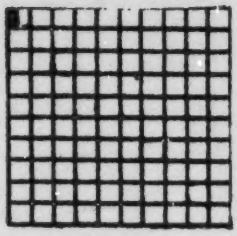
RATIO PERCENT

$\frac{7.5}{100}$ = __.__ %

13. 

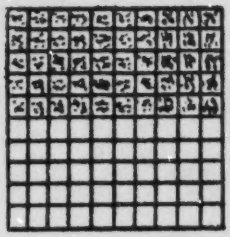
RATIO PERCENT

$\frac{\cdot}{100}$ =

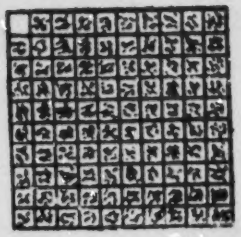
14. 

RATIO PERCENT

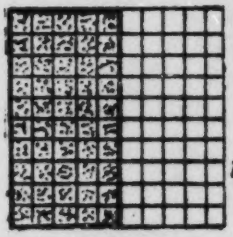
$\frac{.5}{100}$ =

15. 

RATIO PERCENT

16. 

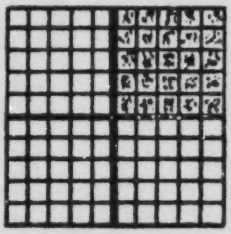
RATIO PERCENT



PART RATIO PERCENT

$\frac{1}{2}$ = $\frac{50}{100}$ = 50%

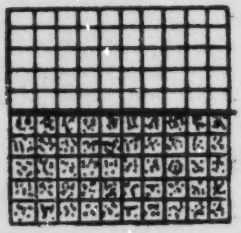
reduced

17. 

PART of WHOLE RATIO %

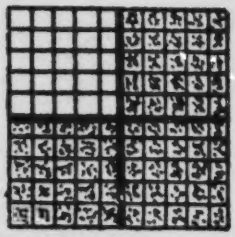
$\frac{1}{4}$ = $\frac{\quad}{100}$ =

reduced

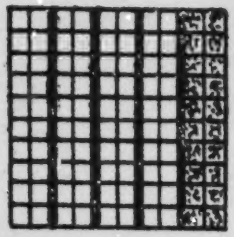
18. 

PART RATIO %

= $\frac{\quad}{100}$ =

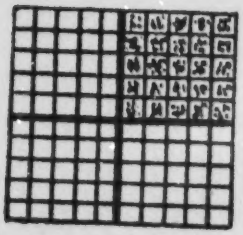
19. 

PART RATIO %

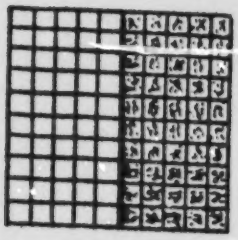
20. 

PART RATIO %

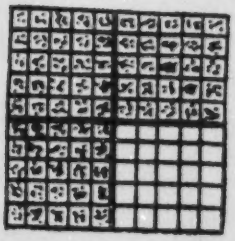
$\frac{1}{5}$ = $\frac{\quad}{100}$ =

21. 

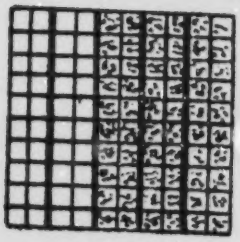
PART RATIO %

22. 

PART RATIO %

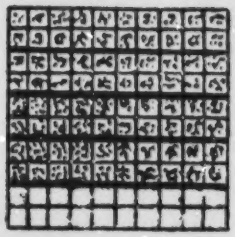
23. 

PART RATIO %

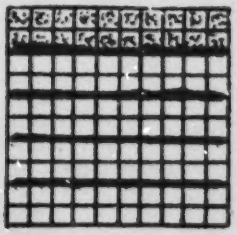
24. 

PART RATIO %

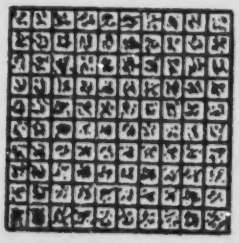
$\frac{3}{5} = \frac{\quad}{100} =$

25. 

PART RATIO %

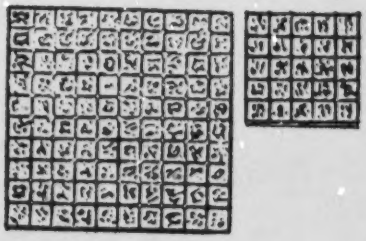
26. 

PART RATIO %

27. 

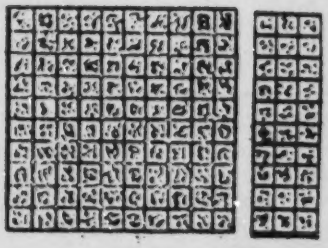
PART RATIO %

$1 = \frac{100}{100}$

28. 

PART RATIO %

$1\frac{1}{4} = \frac{5}{4} = \frac{125}{100} =$

29. 

$1\frac{3}{10} = \frac{\quad}{10} = \frac{130}{100} =$

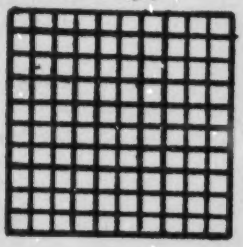
30. ALL of something is 100%

A. HALF of something is ____%

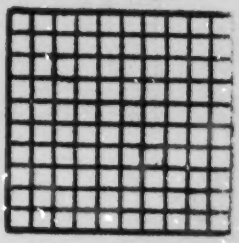
B. A FOURTH of something is ____%

C. THREE-FOURTHS of something is ____%

31. Shade 25%



32. Shade 75%



Name _____ Period ____ Date _____

Objective: You will be able to solve percent problems in proportion form. To find a certain percent of the total.

17% as a ratio is $\frac{17}{100}$.

25% as a ratio is $\frac{25}{100}$ simplified to $\frac{1}{4}$.

Rewrite these percents as simplified ratios.

(1) 30% = $\frac{30}{100}$ = $\frac{3}{10}$

(2) 40% = _____ = _____

(3) 5% = _____ = _____

(4) 90% = _____ = _____

(5) 35% = _____ = _____

A% of B is C, is the basic form of percent problems. Anyone of the letters can be missing and you can find it by using a proportion.
In this lesson, we will work with A% of B is _____.

Example: 30% of 20 is _____

A = _____ B = _____

You have to find C.

Solving a percent problem by proportions, we use the following set-up:

$$\frac{A}{100} = \frac{C}{B}$$

A is always the number of percent.
B is the total.
C is part of the total.

$$\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$$

30% of 20 is _____. We have to find C.

$$\frac{30}{100} = \frac{C}{20} \qquad \frac{30}{100} \qquad \frac{C}{20}$$

$$100C = 30 \times 20$$
$$100C = 600$$
$$C = 6$$

So, 30% of 20 is 6.

Try these now.

(6) 50% of 60 is _____ (7) 40% of 80 is _____

(8) 75% of 120 is _____ (9) 40% of 50 is _____

Name _____

(10) 80% of 200 is _____

(11) 20% of 90 is _____

(12) 90% of 20 is _____

(13) 10% of 30 is _____

(14) 25% of 88 is _____

(15) 30% of 72 is _____

(16) 16% of 140 is _____

(17) 23% of 800 is _____

(18) 11% of 242 is _____

(19) 100% of 35 is _____

(20) 200% of 16 is _____

Name _____ Period _____ Date _____

Objective: You will be able to solve percent problems to find 100% when the part is known.

Remember from lesson 4, A% of B is C, is the basic form for percent problems.

When C is missing, A% of B is _____

$$\frac{A}{100} = \frac{C}{B}$$

Example: 60% of 20 is _____ $\frac{60}{100} = \frac{C}{20}$

$$\frac{60}{100} \quad \frac{C}{20}$$

$$100 \times C = 60 \times 20$$

$$100C = 1200$$

$$C = 12$$

In this lesson you will solve problems that have the letter B as the letter missing.

A% of _____ is C $\frac{A}{100} = \frac{C}{B}$ $\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$

Example:

30% of _____ is 12

$$\frac{30}{100} = \frac{12}{B}$$

$$30 \times B = 100 \times 12$$

$$30B = 1200$$

$$B = 40$$

Now try these:

1) 25% of _____ is 6 2) 30% of _____ is 3 3) 10% of _____ is 7

$\frac{25}{100} = \frac{6}{B}$

$25 \times B = 100 \times 6$

$25B = 600$

$B = 24$

$\frac{25}{100}$ simplifies to $\frac{1}{4}$

$\frac{1}{4} = \frac{6}{B}$

$1 \times B = 6 \times 4 =$

$B = 24$

4) 80% of _____ is 20 5) 100% of _____ is 16 6) 50% of _____ is 11

7) 20% of _____ is 15 8) 35% of _____ is 70 9) 3% of _____ is 1

10) 40% of _____ is 8

Try some word problems:

11) 5% of some number is 12. What is the total number? $\frac{5}{100} = \frac{12}{B}$

$5 \times B = 100 \times 12$

$5B = 1200$

$B = 240$

12) 8% of the Hillview students are absent. If 72 are absent, how many attend Hillview? _____

13) Reggie Jackson hit 40% during one week. That gave him 10 hits for the week. How many times did he come to bat? _____

14) You work hard to get a 6% raise. That means you get $3.00 more a week. How much were you making each week before the raise? _____

15) John saves $15 a week, which is 10% of his pay. What is his regular pay? _____

16) 65% of the class passed the last test. If 13 passed, how many are there in the class? _____

Name _____ Period _____ Date _____

Objective: You will be able to solve percent problems in which you find what percent one number is of another.

You have now solved percent problems for A% of B is C. $\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$

A% of B is _____ and A% of _____ is C

60% of 10 is _____ 20% of _____ is 4

$\frac{60}{100} = \frac{C}{10}$ $\frac{20}{100} = \frac{4}{B}$

$\frac{60}{100}$ reduces to $\frac{3}{5} = \frac{C}{10}$ $\frac{20}{100}$ reduces to $\frac{1}{5}$

$5 \times C = 3 \times 10$
$5C = 30$
$C = 6$

$\frac{1}{5} = \frac{4}{B}$
$1 \times B = 5 \times 4$
$B = 20$

Now you will solve some problems.

(1) _____% of 25 is 10 $\frac{A}{100} = \frac{C}{B}$ $\frac{A}{100} = \frac{10}{25}$

$A \times 25 = 10 \times 100$
$25A = 1000$
$A = 40$

(2) _____% of 60 is 3.

(3) 18 is _____% of 60.

(4) _____% of 48 is 12.

(5) _____% of 50 is 9.

(6) _____% of 70 is 42.

(7) _____% of 60 is 12.

(8) _____% of 200 is 10.

(9) _____% of 200 is 40.

(10) _____% of 50 is 4.

Now try some word problems.

(11) Pittsburg High School played 25 basketball games and lost 6. What percent of the games did they lose? _____

(12) Baseball batting averages are really percents. Reggie Jackson came to bat 80 times and made 16 hits. What percent of the time at bat did Reggie get a hit? _____

(13) If 6 students are absent today and there are 20 in the class, what percent of the class is absent? _____

page 2 Name _____

(14) If a house is valued at $10,000 and property tax is $200, what percent of value of the house is the property tax? _____

(15) In a can of mixed nuts which contains 1000 nuts, 200 are cashews. What percent of the nuts in the can are cashews.

You should now be able to solve any percent problem even when a variety of questions are asked. Let's see how good you are!!

(16) What % of 18 is 18? _____

(17) What is 3% of 2600? _____

(18) What % is 4 of 10? _____

(19) Find 50% of 8. _____

(20) Find 40% of 50. _____

(21) 7 is 10% of what number? _____

(22) 2 is 10% of what number? _____

(23) 9 is what % of 10? _____

(24) In a class of 24, 25% were girls. How many girls were in the class? _____

(25) A 4 ounce sample of ground meat was tested and found to contain 1 ounce of fat. What % of the meat was fat? _____

(26) Lunk Head borrows $200 from a finance company. A year later he pays back the original loan plus $24. What % was he charged to borrow the money? _____

(27) 40% of a family income is spent for food. If $200 a month is spent for food, how much is the income each month? _____

(28) Sales tax is 6%. What tax is charged if you buy a $200 watch? _____

Name _____

P-5 Period _____ Date _____

PERCENT

Writing PROPORTIONS for WORD PROBLEMS

PROPORTIONS - the EASY WAY to solve WORD PROBLEMS.

number by % / 100 = PART / WHOLE

		PROPORTIONS
A	What number is 80% of 60?	
	PART $\frac{80}{100}$ WHOLE	$\frac{80}{100} = \frac{n}{60}$
B	Sixteen is what percent of 48?	
	PART $\frac{n}{100}$ WHOLE	$\frac{n}{100} = \frac{16}{48}$
C	75% of ____ equals 18.	
	$\frac{75}{100}$ WHOLE PART	$\frac{75}{100} = \frac{18}{n}$

1A. Percent (%) means per 100, so the percent is written as a ratio with a denominator of _____.

B. All the proportions in the examples above have a number over 100 equal to a PART over a _____.

2. Each word problem is missing either the number by the %, PART or WHOLE. Tell what is missing in the examples above.

A _____

B _____

C _____

3. What letter is used for the unknown amount? _____

4. The key word "of" helps you find the _____.
WHOLE or PART

The key words "is" or "equals" or the symbol (=) help you find the _____.
WHOLE or PART

P-5

LABEL as in problem 5, then write a PROPORTION. Do NOT solve.

5. 60% of 75 is what number?

$\frac{60}{100}$ WHOLE PART

$\frac{60}{100} = \frac{n}{\square}$

6. What is 5% of $400?

$\frac{5}{100}$

$____ = ____$

7. 10% of 450 equals what number?

8. _____ = 15% of $200.

9. Sometimes the WHOLE is not after the word "of." LOOK for the number that tells you what the WHOLE is.

Sierra has 625 students. Eighty percent passed the division facts timed test. How many students passed?

Rewrite the problem using "of."

% of ___ students is how many?

Write the proportion.

10. There are 250 first graders. Seventy-five percent know the alphabet. How many know the alphabet?

Rewrite the problem.

_____% of _____ is how many?

Write the proportion.

REMEMBER TO LOOK FOR SOMETHING MISSING!

25% of what number is 16?

Is the % missing? "25%" — No

Is the PART missing? "is 16" — No

Is the WHOLE missing? "of what number" — Yes

number by $\frac{\%}{100} = \frac{\text{PART}}{\text{WHOLE}}$

$\frac{25}{100} = \frac{16}{n}$

Show the % as a fraction. Label the WHOLE and the PART.
Then write the proportion. Do NOT solve.

11. 40% of what number is 32?

$\frac{40}{100}$ WHOLE PART

$\frac{\quad}{\quad} = \frac{\quad}{\quad}$

12. What number is 75% of 36?

13. 15 is what percent of 45?

14. 12 out of 18 = _____%.
The (=) is NOT a key to the PART in #14

12 out of 18

$\frac{12}{18} = \frac{\quad}{\quad}$

P-5

Write the PROPORTION for each problem. Do NOT solve.

15. 6 = ____% of 20.

16. 30% of 20 is ____.

17. Twenty percent of what number *equals* fifteen?

18. 25,000 people voted out of 45,000 registered voters. What percent voted?

19. Eighteen scouts went on a hike. Seventy-five percent of the troop hiked. How many were in the troop?

Rewrite:

____ = ____% of TROOP

Proportion:

20. A $60 coat is on sale for 20% off regular price. What is the savings? (20% of $60 = savings)

21. If 4 of every 10 trees in an orchard are apple trees, what % are apple trees?

22. On Tuesday 80% of the students were present. There are 32 students in the class. How many were present?

Rewrite:

____% of ____ = how many

Proportion:

23. José saved $72 to buy a record player. He saved 80% of the co How much does the reco player cost?

Rewrite:

Proportion:

LEVEL P CHECKPOINT 1-5

Percents

Name _____

Period _____

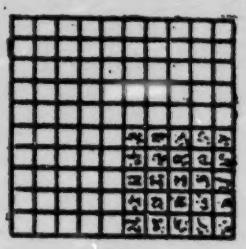
Date _____

1) a) _____ out of

_____ are shaded

b) Ratio Percent

$\frac{\square}{\square} = \square\,\%$



2) one fifth of something is _____%

(P-1)

3) 75% Of 120 is _____

4) 15% of 500 is _____

(P-2)

5) 30% of _____ is 3

6) John saved $20 a week, which is 10% of his pay. What is his regular pay?_____

(P-3)

7) _____% of 20 is 11.

8) Pittsburg High School played 25 basketball games and lost 7. What percent of the games did they lose?_____

(P-4)

9) 80% of 20 is _____

10) Eighteen scouts went on a hike. Seventy five percent of the scouts hiked. How many were in the whole troop of scouts?

_____

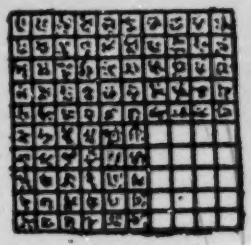
(P-5)

LEVEL P A-CHECKPOINT 1-5 Name _____

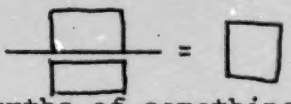
Percents Period _____

Date _____

1) a) _____ out of
_____ are shaded



b) Ratio Percent



2) Three fourths of something is _____.

(P-1)

3) 40% of 80 is _____ 4) 25% of 200 is _____

(P-2)

5) 20% of _____ is 15

6) 60% of the class passed the last test. If 12 passed, how many students are in the class? _____

(P-3)

7) _____% of 70 is 42

8) There are 200 pieces of fruit in a box. What percent are oranges if there are 40 oranges in the box ? _____

(P-4)

9) 25% of 64 is _____

10) Eight students were absent today. This is 40 percent of the class. How many students are in the class? _____

(P-5)

POST TEST P

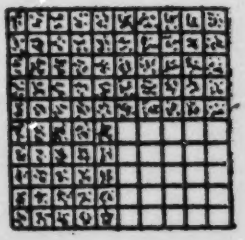
Percents

Name _____

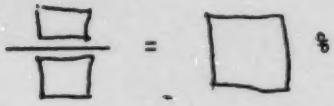
Period _____

Date _____

1) a) _____ out of _____ are shaded



b) ratio = percent



%

2) a) All of something is _____%

b) half of something is _____%

c) one fourth of something is _____%

d) two fifths of something is _____%

(P-1)

Use these proportions to solve all the remaining problems

$\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$ $\frac{A}{100} = \frac{C}{B}$

3) 50% of 60 is _____

4) 17% Of 50 = _____

5) 300% Of 2 = _____

6) 120% of 30 = _____

7) 70% of 200 is _____

8) 20% of 5 = _____

(P-2)

9) 15% Of _____ = 12

10) 200% of _____ is 46

11) 35% of _____ is 70

12) 102% of _____ is 34.68

(P-3)

13) _____% of 50 is 9

14) _____% of 4 is 1

15) _____% of 70 is 42

16) _____% of 36 is 9

17) 6 students are absent today and there are 30 students in the class. What percent of the class is absent? _____

(P-4)

18) What number is 60% of 85? _____

19) sixteen is What percent of 80? _____

20) Linda saved $12, which is 75% of the cost for a dress. How much did the dress cost?

(P-5)

Name _____ Period _____ Date _____

Objective: You will be able to understand the meaning of percent.

The topic of percent presents a distinct challenge in the school curriculum. Basically, this challenge stems from the fact that the concept of percent arose and developed as a creation of the commercial world - a tool in the everyday affairs of industry and business, rather than a creation of mathematicians.

From a mathematical standpoint, percent is most clearly approached as a ratio. In practical computation, however it is often more convenient to express a percent as a fraction or as a decimal.

The word percent means hundredths.

The word percent can be used with any ratio which has a denominator of 100.

$\frac{50}{100}$ can be written 50 percent

$\frac{75}{100}$ can be written 75 percent

1) $\frac{60}{100}$ can be written as _____.

Usually, the symbol % is used in place of the word percent.

$\frac{50}{100} = 50\%$

2) $\frac{75}{100} =$ _____%

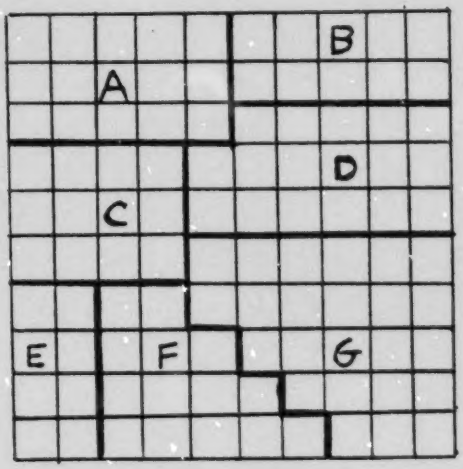
3) $\frac{1}{100} =$ _____%

4) $\frac{?}{100} = 5\%$

5) The symbol for percent is _____. It means hundredths or 2 decimal places.

.15 = 15 hundredths = 15 percent = 15%

There are 100 little squares in this figure. Each little square is $\frac{1}{100}$ or .01 or 1% of the total. The whole figure is 100% which means $\frac{100}{100}$ or 1 whole or all of the square. Part A has 15 little squares. This is .15 or 15% of the total.



Write the correct answer in each blank below.

Part	Squares	Decimal	Percent
A	15	.15	15%
B	_____	_____	_____
C	_____	_____	_____
D	_____	_____	_____
E	_____	_____	_____
F	_____	_____	_____
G	_____	_____	_____

Solve:

A + C = _____%

B + D = _____%

C + G = _____%.

B + E + F = _____%

A + B + G = _____%

PA -2

Name_____

Period_____ Date_____

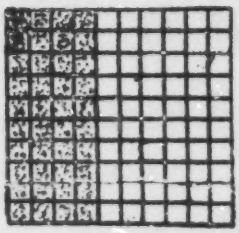
PERCENT

% to $\frac{n}{100}$ to reduced fractions

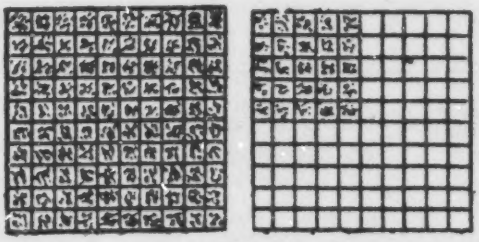
Reduced fractions to $\frac{n}{100}$ to %'s

* Ask for a chart of "COMMON PERCENTS."

CHANGE %'s to SIMPLIFIED FRACTIONS.



$40\% = \frac{40}{100} = \frac{2}{5}$



$125\% = \frac{125}{100} = 1\frac{1}{4}$

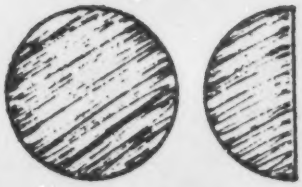
Change each PERCENT to a fraction with a DENOMINATOR of 100, then SIMPLIFY.

1. $25\% = \frac{25}{100} =$ ——
2. $75\% = \frac{\quad}{100} =$ ——
3. $50\% =$ =
4. $10\% =$
5. $1\% =$
6. $100\% =$
7. $200\% =$
8. $80\% =$
9. $4\% =$
10. $300\% =$
11. $150\% =$
12. $85\% =$
13. $250\% =$
14. $40\% =$
15. $60\% =$
16. $45\% =$
17. $70\% =$
18. $90\% =$

CHANGE SIMPLIFIED FRACTIONS TO PERCENTS.

$\frac{1}{2} \cdot \frac{50}{50} = \frac{50}{100} = 50\%$

$\frac{3}{4} \cdot \frac{25}{25} = \frac{75}{100} = 75\%$



$1\frac{1}{2} = \frac{3}{2} \cdot \frac{50}{50} = \frac{150}{100} = 150\%$

Write the fraction pictured, change to an equivalent fraction with a denominator of 100. then a %.

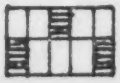
19. shaded

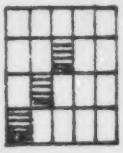
$\frac{1}{2} = \frac{\quad}{100} = ____\%$

20. shaded

21. shaded

22. NOT shaded

23.  NOT shaded

24.  Shaded

Look at the example in the rectangle ABOVE.

25. shaded

$2 = \frac{2}{1} = \frac{\quad}{100} = \square\%$

26. shaded

$1\frac{1}{2} = \frac{3}{2} = \frac{\quad}{100} = \square\%$

27. shaded

28. shaded

29. shaded

PA-2

30. Shade 50%

$50\% = \frac{50}{100} = \frac{1}{2}$

(shade $\frac{1}{2}$ of the circle.)

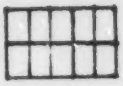
31. Shade 20%

$20\% = \frac{20}{100} =$

32. Shade 40%

33. Shade 80%

34. Shade 60%

35.  Shade 10%

Change each fraction to an equivalent fraction with a DENOMINATOR of 100, then write the PERCENT.

36. $\frac{2}{5} = \frac{\quad}{100} = \square$ %

37. $\frac{1}{4} = \frac{\quad}{100} = \square$ %

38. $\frac{1}{2} = \frac{\quad}{\quad} = \square$ %

39. $\frac{9}{10}$

40. $\frac{3}{4} =$

41. $2 = \frac{2}{1} = \frac{\quad}{100} = \square$ %

42. $\frac{3}{20}$

43. $1\frac{1}{2} = \frac{3}{2} = \frac{\quad}{100} = \square$ %

44. $\frac{17}{25} =$

Shade the following PERCENTS.

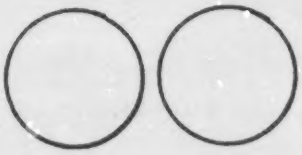
45. 50%

46. 75%

47. 25%

48. 150%

49. 200%



50. 40%

✳ ASK FOR THE CHART OF "COMMON PERCENTS."

Write the following fractions as %'s. Use the SYMBOL %.

51.	52.	53.	54.	55.
$\frac{1}{10}$ =	$\frac{1}{5}$ =	$\frac{1}{8}$ =	$\frac{1}{4}$ =	$\frac{1}{3}$ =
$\frac{2}{10}$ =	$\frac{2}{5}$ =	$\frac{2}{8}$ =	$\frac{2}{4}$ =	$\frac{2}{3}$ =
$\frac{3}{10}$ =	$\frac{3}{5}$ =	$\frac{3}{8}$ =	$\frac{3}{4}$ =	
$\frac{4}{10}$ =	$\frac{4}{5}$ =	$\frac{4}{8}$ =		
$\frac{5}{10}$ =		$\frac{5}{8}$ =		
$\frac{6}{10}$ =		$\frac{6}{8}$ =		
$\frac{7}{10}$ =		$\frac{7}{8}$ =		
$\frac{8}{10}$ =				
$\frac{9}{10}$ =				

56. Look at the tenths above. Explain an easy way to change tenths to %'s.

_____

_____

_____

57. If you know $\frac{1}{8} = 12\frac{1}{2}\%$, how can you change $\frac{3}{8}$ to a % without looking at the chart?

_____

_____

_____

Change each % to a reduced fraction.

58.	59.	60.	61.
$87\frac{1}{2}\%$ =	25% =	$66\frac{2}{3}\%$ =	50% =
62.	63.	64.	65.
80% =	$33\frac{1}{3}\%$ =	12.5% =	87.5% =

PA-3

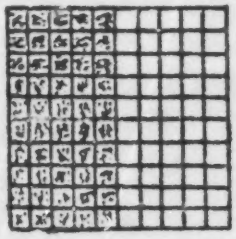
Name_____

Period_____ Date_____

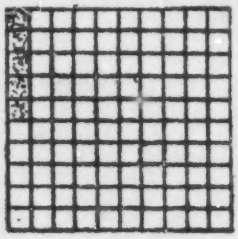
PERCENTS

Percents to decimals
Decimals to %'s

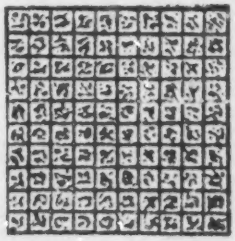
PERCENT means per 100. Change % to $\frac{n}{100}$ then a decimal.



$50\% = \frac{50}{100} = .50$ or .5



$5\% = \frac{5}{100} = .05$



$100\% = \frac{100}{100} = 1.00$ or 1

Change %'s to $\frac{n}{100}$, then write decimal equivalents.

1. $60\% = \frac{60}{100} = .___$
2. $6\% = \frac{6}{100} = .___$
3. $9\% = \frac{9}{100} = .___$
4. $100\% =$
5. $99\% =$
6. $97\% =$
7. $90\% =$
8. $8\% =$
9. $1\% =$
10. $12\% =$
11. $50\% =$
12. $75\% =$
13. $5\% =$
14. $200\% =$
15. $4\% =$
16. $150\% =$
17. $80\% =$
18. $300\% =$

You can write %'s as decimals or whole numbers by ÷ 100

85% = 85 hundredths 5% = 5 hundredths 150% = 150 hundredths

.85 = 85 hundredths .05 = 5 hundredths 1.50 = 150 hundredths

WORK 85% =.85 5% = .05 150% = 1.50 or 1.5

to ÷ 100, move the decimal point two places to the left

Write each percent as a decimal or whole number.

19. 75% = 20. 25% = 21. 5% =

22. 1% = 23. 4% = 24. 12% =

25. 89% = 26. 66% = 27. 2% =

28. 30% = 29. 6% = 30. 8% =

31. 9% = 32. 50% = 33. 100% =

34. 150% = 35. 200% = 36. 125% =

PA -3

You can write decimals as percents by x 100

.15 = 15 hundredths .8 = .80 = 80 hundredths .03 = 3 hundredths

15% = 15 hundredths 80% = 80 hundredths 3% = 3 hundredths

WORK .15 = 15% .8 = 80% .03 = 3%

to x 100, move the decimal point two places to the right

Change DECIMALS to PERCENTS.

37. .04 = ____%

38. .4 = ____%

39. .01 = ____%

40. .1

41. .25

42. .07

43. .9

44. .90

45. .09

46. .03

47. .75

48. 1.50 = ____%

49. 2 = 2.00 = ____%

50. 1

51. 1.5

52. 2.3

53. 3

54. 12

55. To change a decimal to a %, move the decimal point _____ (1, 2, 3) places to the _____ (right or left).

56. .125 = ____%

DECIMAL FRACTIONS WRITTEN AS PERCENTS

.12½ = 12½% 1.75 = 175% .375 = 37.5%

.125 = 12.5% 1.5 = 150% .37½ = 37½%

$.08\frac{1}{3} = 8\frac{1}{3}\%$ 1 = 100% .6 = 60%

Change DECIMALS to PERCENTS.

57. .0 1 = ____% 58. .7 = ____% 59. .1 2 $\frac{1}{2}$ = ____%

60. .3 61. . 6 2 $\frac{1}{2}$ 62. .1 2 5

63. .3 7 5 64. .0 8 $\frac{1}{4}$ 65. .8 7 $\frac{1}{2}$

Change PERCENTS to DECIMALS.

66. 9% = .____ 67. 12.5 % = .____ 68. $6\frac{1}{4}$ %

69. 1% 70. 3 7 . 5 % 71. $9\frac{1}{2}$ %

72. 6 2 5 %

REVIEW

73. $6\frac{2}{3} - 1\frac{4}{5}$

74. $1\frac{3}{10} + 2\frac{3}{100}$ =

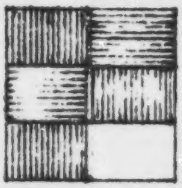
PA-4

Name _____

Period _____ Date _____

PERCENT

Fractions to %'s using a proportion
Decimals to %'s



What percent is shaded? $83\frac{1}{3}\%$

$\frac{5}{6} = \frac{n}{100}$

$(5)(100) = 6n$

$500 = 6n$

$\frac{500}{6} = \frac{6n}{6}$

$n = 83\frac{1}{3}$

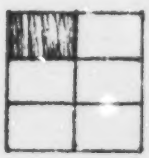
To find "n", DIVIDE BOTH sides by 6. DIVIDING BOTH sides by 6 keeps the sides EQUAL.

$\frac{83\frac{1}{3}}{100} = 83\frac{1}{3}\%$

What % is shaded?

CIRCLE YOUR ANSWERS.

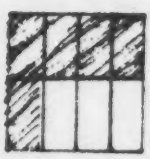
1.

2. 

3.

4.

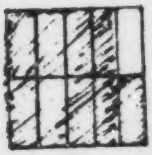
5.

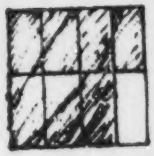
6. 

PA-4

Find the % shaded.

CIRCLE → YOUR ANSWERS.

7. 

8. 

9.

Change to percents.

10. .75 = _____%

11. $\frac{3}{4}$ = _____%

12. .01 = _____%

13. .12 $\frac{1}{2}$

14. .37 $\frac{1}{2}$

15. .6

16. .625

17. $\frac{3}{9}$

18. .2

19. .03

20. $\frac{4}{5}$

21. $\frac{8}{9}$

PERCENTS	100 %	75%	50%	25%	$12\frac{1}{2}$ %
DECIMALS	1.00	.75	.50	.25	.12 $\frac{1}{2}$ or .125
FRACTIONS	$\frac{100}{100} = 1$	$\frac{75}{100} = \frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{12\frac{1}{2}}{100} = \frac{25}{2} \times \frac{1}{100} = \frac{1}{8}$

Name each amount In THREE ways.

PERCENTS	22A. 100%	23A. 50%	24A. ____%	25A. $12\frac{1}{2}$ %
DECIMALS	B. 1.00	B. ____	B. ____	B. ____
FRACTIONS	C. $\frac{\square}{100} = \square$	C. $\frac{\square}{\square} = \square$	C. $\frac{\square}{100} = \frac{1}{4}$	C. $\frac{\square}{100} =$

Work space (if needed).

PERCENTS	26A. ____%	27A. 40%	28A. ____%	29A. ____%
DECIMALS	B. ____	B. ____	B. .01	B. ____
FRACTIONS	C. ____ = $\frac{3}{4}$	C.	C.	C. $\frac{1}{20} = \frac{100}{}$

WORK SPACE.

PA-4

PERCENTS	30A. ____%	31A. 150%	32A. ____%
DECIMALS	B. 2.00	B. ____	B. ____
FRACTIONS	C. $\frac{\quad}{100}$ =	C. ____ =	C. ____ = 3

PERCENTS	33A.	34A.	35A. 85%
DECIMALS	B. .125	B.	B.
FRACTIONS	C.	C. ____ = $\frac{1}{3}$	C.

LEVEL PA CHECKPOINT 1-4
Percents II

Name _____
Period _____
Date _____

1) a) $\frac{65}{100}$ = _____% b) $\frac{5}{100}$ = _____%

(PA -1)

Change to a simplified fraction or whole number

3)a) 85 % _____ b) 200 % _____

4) $12\frac{1}{2}$ % _____

Change to percents

5) a) $\frac{2}{5}$ = _____% b) $\frac{1}{6}$ = _____%

(PA-2)

Change to decimals

6) a) 89% b) $8\frac{1}{2}$ %

Change to percents

7) a) .04 b) 2

8) a) $.87\frac{1}{2}$ b) .413

(PA-3)

9) Change to percents

a) _____% b) .2 = _____%

10) Write each amount in three ways

	a	b	c
percent		35 %	
decimal	.60		
fraction	$\frac{}{100}$ =	$\frac{}{100}$ =	$\frac{}{100} = \frac{2}{5}$

(PA -4)

LEVEL PA A-CHECKPOINT 1-4

Name _____

Period _____

Date _____

Percents II

1) $\frac{37}{100}$ = _____ %
(PA-1)

2) $\frac{192}{100}$ = _____ %

Change to simplified fractions or whole numbers

3) a) 6 % _____ b) 300 % _____

4) $66\frac{2}{3}$ % _____

Change to percents

5) a) $\frac{3}{5}$ = b) 2 =
(PA-2)

Change to decimals

6) a) 3 % = _____ b) 37.5 % = _____

Change to percents

7) a) .05 = _____ % b) .8 = _____ %

8) a) .375 = _____ % b) .06 $\frac{1}{4}$ = _____ %
(PA-3)

Change to percents

9) a) _____ %

b) .75 = _____ %

Write each amount in three ways

10)

	a	b	c
percent		80%	
decimal			.51
fraction	$\frac{}{100} = \frac{3}{10}$	$\frac{}{100}$ =	$\frac{}{100}$ =

(PA-4)

PERCENT PA-5

Name _____ Period _____ Date _____

Objective: You will be able to use proportions to work practical problems with percent.

Percent has many uses. These problems illustrate some of them. Set up the required proportion and find the answer.

(1) Jack wanted to buy a used car which cost $400. The sign on the car called for a 20% down payment. How much was the down payment?

$$\frac{\quad\%}{100} = \frac{\quad}{400}$$

20% of 400 = _____

(2) A science class has 40 students. On Monday, 5% were absent. How many students absent?

5% of 40 = _____

(3) A sign in a hardware store gave the price of a hammer as "50% off the original cost." If a hammer sold for $6.50 before, what would it now cost?

50% of $6.50 = _____

(4) A salesman in a store is paid according to how much he sells. This is called commission. If he sells $8000 worth of items in one week with a commission of 3%, what will he earn?

3% of $8000 = _____

(5) A store offers shoes at only 75% of the original cost. What will a pair of shoes originally costing $16 sell for? _____

(6) A salesman earns a commission of 6% on sales of $650. What will he earn? _____

(7) The Los Angeles Lakers played 85 games and won 6 f them. How many games did they win? _____

Name _____

(8) John scored 90% on a test of 30 questions. How many did John get correct? _____

(9) A sales tax of 5% is charged on all items sold except food. What is the tax on a coat costing $10.00? _____

(10) The sales tax is added to the cost of items sold. What is the total charge for the coat in problem #9? _____

(11) A piano marked to sell for $525 is sold at 10% off the marked price. How much money is taken off the marked price? _____

(12) Find the selling price of the piano in problem #11._____

(13) A sales tax of 5% is charged on a dress costing $26.40. How much tax is charged? _____

(14) What is the total cost of the dress in problem #13? _____

(15) A teacher tells her class they must score 60% on a test of 40 problems in order to pass. How many answers could a student <u>miss</u> and still pass the test? _____

Name _____ Period _____ Date _____

Objective: You will be able to solve percentage problems containing fractional parts of a percent.

Percents are often given as fractions or mixed numbers.

1) Find $12\frac{1}{2}\%$ of 88.

The proportion: $\frac{12\frac{1}{2}}{100} = \frac{N}{88}$

Solving the proportion:

$100 \times n = 12\frac{1}{2} \times 88$

$100n = \frac{25}{2} \times \frac{88}{1}$

$100n =$ _____

$n =$ _____

2) Find $2\frac{1}{2}\%$ of 42

$\frac{2\frac{1}{2}}{100} = \frac{N}{42}$

Solving the proportion :

$100 \times n = 2\frac{1}{2} \times 42$

$100n = \frac{5}{2} \times \frac{42}{1}$

$n =$ _____

3) Find $2\frac{3}{4}\%$ of 50

4) Find 5.5% of 23

Solution: $\frac{5.5}{100} = \frac{n}{23}$

$100 \times n = 5.5 \times 23$

$n =$ _____

5) Find $33\frac{1}{3}\%$ of 99.

Solution: $\frac{33\frac{1}{3}}{100} = \frac{n}{99}$

$100 \times n = 33\frac{1}{3} \times 99$

$100 \times n = \frac{100}{3} \times \frac{99}{1}$

$n =$ _____

6) Find 2.1% of 8

7) Find $6\frac{1}{4}\%$ of 64

8) Find 12.5 % of 64

9) Find 62.5 % of 64

10) Find $12\frac{1}{2}$ % of 64

11) Find $66\frac{2}{3}$ % of 150

12) Find $\frac{3}{4}$ % of 800

13) Find $87\frac{1}{2}$ % of 176

14) Find 87.5 % of 176

15) Find $6\frac{1}{2}$ % of 64

16) Find $7\frac{1}{2}$ % of 120

17) Find .12 % of 892

18) Find $16\frac{2}{3}$ % of 96

19) Find $2\frac{1}{2}$ % of 200

20) $2\frac{1}{2}$ % of 60 =

21) $5\frac{1}{3}$ % of 55 =

22) $4\frac{3}{4}$ % if 70 =

23) $2\frac{1}{2}$ % of 90 =

24) $\frac{1}{2}$ % of 900 =

PERCENT PA-7

Name _____ Period _____ Date _____

Objective: You will be able to use the equation form to solve percent problems.

1) Find 25% of 48

a) proportion method

$\frac{25}{100} = \frac{N}{48}$

$100N = 25 \times 48$

$100N = 1200$

$N = 12$

b) Equation methods

1) $25\% \times 48 = N$

$.25 \times 48 = N$

$12 = N$

2) $25\% \times 48 = N$

$\frac{1}{4} \times 48 = N$

$12 = N$

2) You already know the proportion method; perhaps you will like the equation method as well. As stated in lesson one it is often more convenient to express a percent as a fraction or a decimal in practical computations.

a) The "of" in the original problems means times.

b) The 25% can be changed to a decimal .25 or a fraction $\frac{25}{100}$ reduced $\frac{1}{4}$.

So 25% of 48 becomes .___ x 48 or _____ x 48

Try some either equation form.

3) 25% of 4 = _____

4) 63% of 50 = _____

5) 95% of 20 = _____

6) 8% of 96 = _____

Use decimal method on 7 and 8

7) 3.2% of 60 = _____

8) 5.2% of 60 = _____

Use fraction method

9) $12\frac{1}{2}\%$ of 64 = _____

10) 20% of 75 = _____

11) Find 25% Of _____ is 8

Proportion method

$\frac{25}{100} = \frac{8}{B}$

$25B = 800$

$B = 32$

Equation form

1) 25% = .25

then divide .2) 8. 0 0 (32.

$B = 32$

2) $25\% = \frac{1}{4}$

$8 \div \frac{1}{4} = 8 \times \frac{4}{1} = 32$

$B = 32$

PERCENT PA-?

Name _____ Period _____ Date _____

Objective: You will be able to use the proportion method to solve problems about discount and percent of increase or decrease.

One of the very common uses of percent is in figuring discount.
Discount refers to the amount taken off a selling price.

1) A radio sells for $50, but it is advertised at a 10 % discount.

Original Price $50 Discount 10 %

$\frac{10}{100} = \frac{N}{\$50}$

$100N = \$500$

$N = \$$_____

How much do you pay?

original price $50

discount $ 5

new price $_____

2) The bus company allows students a 25% discount. How much is a $6 student ticket co

Original price $6

Discount 25 %

$\frac{25}{100} = \frac{N}{6}$

_____ = _____

N = _____

New price is _____

3) Clerks at a record store are allowed a discount of 15 %. What would a clerk pay for a $4 record.

4) A store advertised towels at $33\frac{1}{3}$ % off. What will towels marked $4.50 sell for?

5) At a store sale, all bicycles are marked "40 % off". What would a $52 bicycle sell for?

6) A shirt usually sells for $5. If a 30 % discount is put on it, what will the shirt sell for?

The percent of change

A newspaper headline says-- "The cost of living has increased by 2 %." "The population decreased 5 % last year."

This rate of change or percent of change is a ratio of the actual change to the original amount.

7) The cost of a dozen eggs went from 40¢ last week to 45¢ this week. Find the percent of increase.

The price change is found by subtracting.

$$\begin{array}{r} 45¢ \\ -\ 40 \\ \hline 5¢ \end{array}$$

$\frac{n}{100} = \frac{5¢ \text{ - price chan}}{40¢ \text{ - original p}}$

What was the % of increase? _____

8) The price of eggs fell from 45¢ last week to 40¢ this week.

Subtract to find the amount of change.

$$\begin{array}{r} .45 \\ -\ .40 \end{array}$$

$\frac{n}{100} = \frac{\quad}{45}$

What was the % of increase? _____

9) A store owner bought some hats for $5 but was unable to sell them for a profit. He put them on sale for $4 and got rid of them. What was his % of loss or decreas

_____

10) A man earning $150 a week got a $30 a week raise in pay. What was the percent of increase?

_____

11) A store paid 50¢ each for some watermelons and sold them for 63¢. What was the percent of profit or increase? _____

12) A man fought a car for $5,000. At the end of one year he sold the car but could get only $2500 for it. What was the percent of decrease? _____

Name _____ Period _____ Date _____

Objective: You will be able to find simple interest.

Interest is money paid for the use of money.

If you owe someone else for money or merchandise, you pay them interest.

If a person, bank or other business owes you money, they pay you interest.

IMPORTANT: Study these terms and remember them.

PRINCIPAL is the money owed.

RATE is the interest expressed as a %.

TIME IS HOW LONG THE LOAN LASTS.

INTEREST is found multiplying the principal by the rate by the time in years.

This is written as: $i = p \times r \times t$ or $i = prt$

Amount is the principal added to interest.

Simple interest ($i = prt$)

1) Find the interest on $50 (principal) at 5 % (rate) for 1 year (time).

5 % of $50 = _____ Principal x rate

x _____ Time

_____ Interest

2)

Find the interest on $400 at 8 % for 3 years.

8 % of $400 = _____ Principal x rate

x 3 Time

_____ Interest

3)

Find the interest on $760 at 9 % for 4 years.

9% of $760 = _____ Principal x rate

x _____ Time

_____ Interest

4)

Find the interest on $136 at 6 % for $2\frac{1}{2}$ years.

_____ Principal x rate

x _____ Time

_____ Interest

5)

Find the interest on $240 at 5 % for $\frac{1}{2}$ year.

6) Find the interest on $625 for 2 years at 10 %.

7) Find the total interest on $580 for 5 years at 8%.

8) Find the total interest on $825 for 4 years at 12%.

9) A store advertises a washing machine for $210. The machine can be bought and paid for over 3 years time at 10%. What will the total interest be? _____

10) For the machine in problem #9, what is the total cost of the machine?_____
Add: Sales price plus interest.

11) What will the monthly payments be for the machine in problems 9 and 10? _____
Divide total cost by 36.

12) Mrs. Keedy bought a sewing machine for $185. She will pay for it over a 2 year period with interest at 18%. What is the interest charge on the sewing machine?_____

13) What is the total cost of the sewing machine in problem #12?

14) How much will Mrs. Keedy pay each month for 24 months for the machine in problem 13?

_____

LEVEL PA CHECKPOINT 5-9 Name _____

Period _____

Percents II Date _____

1) A sales tax of 6 % is charged on a purchase of $42. How much tax was charged? _____

2) A saleman earned 8 % commission on a sale of $6,000. What was his commission? _____

(PA-5)

3) What is $1\frac{1}{2}$ % of 800 ? _____

4) What is 4.2 % of 360 ? _____

(PA-6)

5) 25 % of 12 is _____ 6) 50 % Of _____ is 11

7) _____% of 20 is 15

(PA-7)

8) A sweater is on sale for 30 % off. If the regular price is $12., what is the sale price ? _____

9) A man earning $150 a week got a $12 raise(a week), what was the percent of increase ? _____

10) Bread prices fell from 80¢ to 75¢ this week. What was the percent of decrease ? _____

(PA-8)

11) Find the interest of a loan for $900 at 10% for 2 years.

_____

12) Credit cards usually have a 18% rate for interest. If you bought a stereo for $400, how much interest would you pay if you paid it off in 6 months ? _____

(PA-9)

LEVEL PA A-CHECKPOINT 5-9 NAME _____

Period _____

Percents II Date _____

1) A sales tax of 6% is charged on a purchase of $55. How much tax was charged ? _____

2) A salesman earns a commission of 9% on a sale of $5,000. What will be his earnings ? _____

(PA-5)

3) What is $2\frac{1}{2}$ % of 500 ? _____

4) What is .4% of 360 ? _____

(PA-6)

5) 30% of 52 is _____ 6) 40% of _____ is 82

7) _____% of 45 is 18

(PA-7)

8) Good students get a 20% discount on their car insurance. If Chester qualified this year, how much would his insurance policy cost if the regular cost is $400 a year ? _____

9) Racheal bought belts for $4 each, but had to sell them at a loss for only $3.50 . What was the percent of decrease?

_____

10) The price of a candy bar rose from 20¢ to 25¢ last year. What was the percent of increase? _____

(PA-8)

11) Find the interest on a loan of $500 at 8% for 6 years.

_____

12) Mike borrowed $1,000 at a interest rate of 12% and paid it off in 18 months. How much interest did he pay? _____

(PA-9)

POST TEST PA

Percents II

Name _____

Period _____

Date _____

1) $\frac{35}{100}$ can be written as _____% 2) $\frac{1}{100}$ = _____%

3) Percent means _____ 4) 100% = _____

(PA-1)

Change to simplied fractions or whole numbers

5) 4% 6) 45%

7) $33\frac{1}{3}$% 8) 200%

Change to percents

9) _____% (shaded) 10) $\frac{4}{5}$ = _____%

11) 4 = _____% 12) $\frac{2}{3}$ = _____%

(PA-2)

Change to decimals

13) 97% = _____ 14) 4% = _____

15) $9\frac{1}{2}$% = _____ 16) 12.5% = _____

Change to percent

17) .53 = _____% 18) $.37\frac{1}{2}$ = _____

19) .9 = _____% 20) .043 = _____

(PA-3)

21) _____% (shaded) 22) .75 = _____%

23) .2 = _____%

Write each amount in three ways

percents	24) a) 100%	25) a) _____%
decimals	b)	b)
fractions	c) $\frac{}{100}$ =	c) $\frac{}{100} = \frac{1}{20}$

POST TEST (cont.)

Write each amount in three ways

percents	26) a) $12\frac{1}{2}\%$	27) a) _____%
decimals	b)	b) 7
fractions	c) $\frac{\quad}{100}$ =	c) $\frac{\quad}{100}$ =

(PA-4)

28) Income tax for Joe is 23%. How much tax did he pay if he earned $18,000? _____

29) A salesman earns a commission of 6% on sales. If he sold a carpet for $650, how much did he earn? _____

30) Peter scored 94% on a test of 50 questions. How many questions did he get correct? _____

(PA-5)

31) $66\frac{2}{3}\%$ of 90 is _____ 32) .2% of 1000 is _____

33) $5\frac{1}{2}\%$ of 60 is _____ 34) $13\frac{3}{4}\%$ of 26 is _____

(PA-6)

35) 40% of 8 is _____ 36) $2\frac{1}{2}\%$ of _____ is 2

37) _____% of 5 is 4

(PA-7)

38) Gasoline prices rose from $1.26 to $1.46 a gallon. What is the percent increase. (round off to nearest %) _____

39) Hamburger prices fell from $1.90 to $1.82. What was the percent of decrease ? (round off to the nearest %) _____

40) Lunch tickets are $1.50. How much do you pay with a 30% discount? _____

(PA-8)

41) 9% interest for 6 months on $500 is _____

42) Find the interest oa a loan of $1000 for 5 years at 16% _____

(PA-9)